

V. *An Account of some Experiments touching the keeping of Fishes in Water under different Circumstances.*  
By Mr Fr. Hauskbee, F. R. S.

THE Fishes made use of in the following Experiments were Gudgeons; which are a sort of Fish very brisk and lively in the Water, and will live a pretty considerable time out of it. Three of them I put into a Glass Vessel, to about three Pints of common Water (which Fishes were to be a standard to compare the others by.) Into another Glass, to a like quantity of Water, I put three more of them, which quantity of Water just fill'd this Glass to the very Brim; upon which I screw'd down a Brass Plate with a Leather between, to prevent a Communication with the Water in the Glass and the External Air: And that it might the better resemble a Pond of Water frozen over (on which account this Experiment was made) I suffer'd as little Air as possible to remain on the Surface of the included Water. The third Glass had a like quantity of Water put into it as the former; which Water, first by boyling, then by continuing it a whole Night in *Vacuo* on the Air Pump, was purg'd of its Air to the greatest nicety: Into this Water also, I put a like number of Gudgeons as into the other. Thus (the Fishes being all put into their respective Receivers) I apply'd my self to wait the Event; which was as follows. It was about half an Hour after Ten in the Morning when I began the Experiments; and in about half an Hour from that time, I observ'd the Fishes in the exhausted Water, or Water purg'd of its Air, began to discover some uneasiness, by a more than ordinary Motion

Motion in their Mouths and Gills, or Respiration, if I may call it so, differing from the Fishes in the other Glasses; the included Fishes at the same time discovering no alteration; only I took notice that they would now and then ascend to the top of the Water, but suddenly swim down again: And in this State they continued for some considerable time, without any sensible Alteration. About 5-Hours after the last Observation, the Fishes in the exhausted Water became not so active (upon a Motion given the Glass that contain'd them) as before: And those Gudgeons included without any Communication with the outward Air, now began considerably to abate of their Vivacy; yet still continued at times their Motions upward and down again. At Seven in the Evening, the included Fishes lay all at the bottom of the Glass, with their Bellies upwards; nor upon shaking the Glass, could I put them in Motion, or cause them to stir their Fins or Tail; only I could observe a Motion in their Mouths, which shew'd me they were not perfectly dead. In this State they lay for some time: But considering the Experiment would not be compleat, if I did not attempt their Recovery by taking off the Brass Cover, being very sure they must have dy'd in some small time under the Circumstances they were then in, accordingly I took off the Cover, and gave the Surface of the Water a free and open Communication with the External Air. At about Ten at Night, I observ'd them again; at which time their Recovery was so evident, that upon a little disturbing the Glass that contain'd them, they were actually in Motion again: And at this time also, the Fishes in the Water purg'd of Air, began to appear more brisk and lively than at the last Observation. Here I cannot but take notice, that notwithstanding the Water was purg'd of its Air to a very great degree, yet the Fishes put into it did not so much as once ascend in it; but continued always at the bottom

bottom, as the Fishes did in the common Water. At this time I left them till the next Morning; when about Eight a Clock I found them as perfectly well and lively in all the Glasses, as when they were first put in. Those in the common Water expos'd to the open Air, suffer'd no manner of change during the whole time. After this I was willing to try whether the Air had again insinuated itself into the purg'd Water, and whether that might not be the occasion of the Fishes Recovery. Accordingly I put it on the Plate of my Pump, in the same Glass with the Fishes in it; and being cover'd with another Receiver, the Air was taken from it; yet I could perceive very little Air ascend in it, and to me it seem'd to be much in the same State as when the Fishes were first put in. I continued it *in Vacuo* about an Hour and half; the Fishes almost all the time continued at the top of the Water, and at that time appeared as dead; for upon letting in the Air, they sunk hastily to the bottom, without any Motion of their Fins or Tails.

From the whole Account I observe;

*First*, That Water purg'd of Air, so far as the Method here made use of, is capable to do it, renders it not altogether unfit to support the Lives of Water Animals. For altho' when the Fishes were first put in, and for some Hours after, they seem'd to suffer some uneasiness; yet at length the Water became more familiar to them, or their Constitutions in some measure did so conform, as to render the Water to them, and them to the Water more agreeable: Otherwise I do not see how their Recovery should follow, since upon examining, little or no alteration could be found in the Circumstances of the Water, from the time the Fishes were first put in.

*Secondly*, The Fishes included with their Water from any Communication with the External Air, plainly demonstrate, that common Water in its Natural State is

not alone sufficient to preserve the lives of its Natural Animals. Hence it follows, that in Ponds, when the Water comes to be frozen over with a pretty thick Ice, the Fishes in the said Ponds are very likely, if not certain to perish, upon the continuance of such a Congelation for some time on their Surfaces; unless (as in the latter part of the Experiments) the Impediment, which hinder'd the immediate Contact of the Air to the Surface of the Water, be remov'd; that is, by breaking Holes in the Ice, whereby it is restored, and undoubtedly will perform the same thing as my Removal of the Brass Plate. This is to be understood only in Ponds, where the Water is stagnant; for where there are Springs, or a current of Water constantly succeeding under the Ice, the effect most likely will not be the same.

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VI. *Part of a Letter from Mr. Patrick Blair to Dr. Hans Sloane, R. S. Secr. Giving an Account of the Asbestos, or Lapis Amiantus, found in the High-lands of Scotland.*

**I** Take leave to communicate the Relation of a Gentleman in the *High-lands*, not many Miles hence, who has lately built an House of a singular kind of Stone, digg'd out of a Quarry not far from him. This Stone, after the Rubbish, which is not very deep, is done away, lyes Horizontally in a Bed endu'd with parallel Fibres, with few Interstices, soft at the beginning, and easy to be smooth'd and polish'd without any Tool, but rather with Sand, or an other hard Stone of a blewish Colour, which afterwards hardens so, that it resisteth the injuries of Air or prejudice of Fire. When  
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